

2013 Freeway Management Survey

AGENCY CHARACTERISTICS

1. **Total freeway centerline miles operated by your agency:**

2. **Indicate the number of staffs performing freeway management, operations and maintenance in the following categories:**
 - Number of in-house management and operations staff:
 - Number of outsourced management and operations staff:
 - Number of in-house maintenance staff:
 - Number of outsourced maintenance staff:

3. **What types of training do you provide and/or require for in-house freeway management staff? (Check all that apply)**
 - Provide funding and encouragement for personnel to attend training
 - Provide training program
 - Require formal training leading to certification

4. **What types of training do you provide and/or require for outsourced freeway management staff? (Check all that apply)**
 - Provide funding and encouragement for personnel to attend training
 - Provide training program
 - Require formal training leading to certification

SURVEILLANCE

5. **Total number of freeway centerline miles with real-time traffic data collection technologies (does not include Closed Circuit TV or CCTV):**

5. a. **Number of these miles where real-time traffic data are collected using roadside infrastructure such as loops, radar detectors, or video imaging detector systems:**

5. b. **Number of these miles where real-time traffic data are collected by vehicle probes, using technology such as toll tag readers, cell phones, etc.:**

6. **What type of vehicle probe readers are used to obtain traffic information? (Check all that apply)**
 - Toll tag readers
 - Blue tooth readers
 - Cellular phone readers
 - GPS readers
 - License plate recognition
 - Do not collect vehicle probe data
 - Other readers (please specify):

7. **Total number of freeway traffic surveillance detector stations deployed by your agency:**

8. For each of the following technologies, please indicate the number deployed by your agency and the approximate percentage that are operational (reliably operating as intended):

	Number Deployed	Percent Operational
Loop stations:		
Radar stations:		
Video imaging detector stations:		
Toll tag readers:		
Other stations (please specify):		

RAMP CONTROL

9. Total number of freeway entrance ramps operated by your agency:

10. Does your agency have freeway entrance ramp metering?

- Yes
- No

11. Total number of ramps with ramp metering:

12. Total number of metered ramps with priority access for transit vehicles:

13. Total number of metered ramps with bypass lanes for High Occupancy Vehicles (HOVs):

14. Total number of metered ramps with preemption access capability for emergency vehicles:

15. Does your agency deploy automated enforcement technologies to assist with the enforcement of ramp metering compliance?

- Yes
- No

16. Is ramp meter timing adjusted in coordination with nearby arterial traffic signal timing to manage queues that form on the ramp that spill back onto the adjacent arterial?

- Yes
- No

17. Under what circumstances do you meter traffic on ramps as a traffic management strategy? (Check all that apply)

- Time of day (recurrent congestion)
- Traffic incidents
- Planned special events
- Weather (e.g., fog, rain, snow)
- Evacuation
- Other (Please specify):

18. Is nearby arterial traffic signal timing adjusted to manage queues that form on the ramp that spill back onto the freeway facility?

- Yes
- No

19. Do you have any ramps with automated ramp closure capability?

Yes

How many?

What conditions or circumstances trigger an automated ramp closure? (Check all that apply)

During evacuations

Planned special events

Emergencies

Weather events

Other stations (please specify):

No

TRANSPORTATION MANAGEMENT CENTER (TMC)

20. Screening question: Does your agency operate managed lanes on the freeway?

Yes

TMC Name:

TMC Coverage:

No

MANAGED LANES

21. Screening question: Operate managed lanes?

Yes

No

21. a. Total number of freeway centerline miles featuring managed lanes:

21. b. Please provide the estimated number of freeway centerline miles for each type of managed lane strategy:

Occupancy control (HOV):

Reversible flow:

Lane open/closed (traffic incidents, roadway maintenance, etc.):

Truck only:

Variable speed limit:

High Occupancy Toll (HOT):

Other congestion pricing strategies:

Other managed lane strategy (please specify):

21. c. Does your agency have a written protocol or arrangement to suspend HOV/HOT enforcement under incident conditions?

Yes

No

Not applicable

MODELING AND DECISION SUPPORT

22. Does your agency use any Analysis, Modeling and Simulation (AMS) tools to optimize/model the freeway system?

Yes

Please specify:

No

23. Has your agency deployed a decision support system to assist in operations of the following? (Check all that apply)

Road weather management

Incident management

Emergency management

Evacuation

Maintenance

No decision support system deployed

Other (please specify):

AUTOMATED ENFORCEMENT

24. Does your agency deploy automated speed enforcement technologies on freeway general use lanes?

Yes

What types of technologies are used? (Check all that apply)

License plate recognition

Camera

Toll tag readers

None

Other stations (please specify):

No

25. Does your agency deploy automated speed enforcement technologies on freeway general use lanes?

Yes

What types of technologies are used? (Check all that apply)

License plate recognition

Camera

Toll tag readers

None

Other stations (please specify):

No

SAFETY AND ROAD WEATHER MANAGEMENT

26. Has your agency deployed any of the following safety systems? (Check all that apply)

Over-height warning system

Automated and/or manual freeway ramp gates

Reference Location Signs

Dynamic Curve Warning System

None of the above

27. What are your agency's sources of weather and road weather information? (Check all that apply)

- National Weather Service products
- FAA (ASOS, AWOS, etc.)
- USGS earthquake alerts
- Agency field personnel
- Agency field sensors (RWIS/ESS, probes, etc.)
- National sensor data sources (Clarus/MADIS)
- Private providers
- Other (please specify):

28. Does your agency employ safety warning systems related to road weather events?

Yes

What hazards are covered? (Check all that apply)

- High wind
- Icy roads
- Fog
- Dust
- Other

No

29. Has your agency deployed any Environmental Sensor Stations (ESS)?

Yes

How many?

What data are collected by ESS and in-pavement sensors? (Check all that apply)

- Pavement temperature
- Pavement surface condition
- Pavement precipitation
- Temperature
- Humidity
- Wind speed
- Precipitation (rain)
- Precipitation (snow)
- Other (please specify):

No

30. Is your agency using or planning to use a Maintenance Decision Support System (MDSS) for winter maintenance? (MDSS includes software systems that provide strategic and tactical weather forecasts, support treatment decision making and provide summary.)

Yes, agency uses an MDSS

Yes, considering (pilot project, used partially, used in one district)

No, agency needs an MDSS, but does not have a system

No, agency does not need an MDSS

31. Does your agency implement restrictions on vehicles during inclement weather (e.g., road closures to high-profile vehicles during high winds, snow tire/chain requirements during winter weather)?

Yes

No

32. Does your agency change traffic incident management practices in response to inclement weather (e.g., repositioning assets, quick clearance during weather, etc.)?

Yes

No

33. Does your agency deploy variable speed limit systems?

Yes

What event triggers the deployment? (Check all that apply)

Weather

Traffic volume

Incidents

Other (please specify):

No

INCIDENT MANAGEMENT/WORK ZONE MANAGEMENT

34. Total number of freeway centerline miles patrolled by service patrol:

35. Please provide the number of freeway centerline miles covered by the following incident detection/verification methods:

Closed Circuit Television (CCTV):

Call boxes:

Computer algorithms to detect incidents:

Other (please specify):

36. Total number of Closed Circuit Television (CCTV) cameras deployed on freeways:

37. Does your agency deploy ITS technology at work zones?

Yes

What ITS technologies does your agency deploy at work zones? (Check all that apply)

Intrusion alarm

Dynamic lane merge system

Queue detection and alert system

Variable speed limit

Travel time system

Route guidance around work zones

Portable CCTV

Other (please specify):

No

TRAVELER INFORMATION

38. . Number of freeway centerline miles covered by Highway Advisory Radio (HAR):

39. Total number of permanent Dynamic Message Signs (DMS) deployed on freeways:

40. Does your agency use the DMS in the absence of incidents or special events?

Yes

Please describe:

No

41. Does your agency have an agreement with a private vendor to push mobile alerts regarding incidents, roadway conditions, etc. to mobile media?

- Yes
- No

42. What methods are used to disseminate traveler information on freeways by your agency? (Check all that apply)

- 511
- Other (non-511) telephone systems
- Email or alert
- Twitter
- Facebook
- App for mobile device such as tablet or smart phone
- Dynamic Message Signs
- Website
- Highway Advisory Radio
- Other (please specify):

43. Please indicate whether your agency reports any of the following information to the public. (Check all that apply)

- Roadway or lane blocking incidents and events on arterials
- Work zone location and duration on arterials
- Roadway weather observations on arterials
- Freeway blocked or with other travel restrictions
- None of the above

44. Do you report freeway travel time data?

- Yes
 - What freeway travel time data are reported? (Check all that apply)
 - Travel time by segment
 - Travel time over selected route
 - Other (please specify):
- No

SYSTEM PERFORMANCE MEASUREMENT

45. Does your agency collect operations data to track freeway network system performance?

- Yes
- No

46. Does your agency have clearly stated and documented operational objectives and performance measures for the freeway system?

- Yes
 - Has your agency established targets for the performance measures?
 - Yes
 - No
- No

47. Does your agency use archived operations data to track freeway system performance?

Yes

What are the archived operations data used for? (Check all that apply)

Real-time Operations (e.g., used in real-time to adjust system operations)

Capital planning/analysis

Operations planning/analysis

Dissemination to the public

Planning/analysis of work zone design

Other (please specify):

No

48. Which of the following measures are used to report on the performance of the freeway system? (Check all that apply)

Travel time

Travel time reliability

Vehicles per lane per mile

Vehicles per hour

Person throughput per lane per hour

Person throughput per hour

Average auto occupancy

Average queue length

Performance measures are not used

Other (please specify):

MAINTENANCE OF FREEWAY MANAGEMENT ITS TECHNOLOGY

49. Does your agency utilize an asset management system to track infrastructure inventory and related maintenance and operations activity?

Yes

No

50. Does your agency have a preventive maintenance program for ITS devices?

Yes

How often are your ITS devices inspected and re-calibrated?

a. Loop detectors

Less than once annually

Once annually

More than once annually

Not regularly inspected and recalibrated

Not Applicable

b. Other Types of Detectors (radar, microwave, toll tag readers)

Less than once annually

Once annually

More than once annually

Not regularly inspected and recalibrated

Not Applicable

- c. CCTV Cameras
 - Less than once annually
 - Once annually
 - More than once annually
 - Not regularly inspected and recalibrated
 - Not Applicable

- d. Other (please specify):
 - Less than once annually
 - Once annually
 - More than once annually

No

51. How are decisions for maintenance, repairs, and replacement of ITS devices made? (Check all that apply)

- Reaction to failure in component or device
- Planned program of routine and preventive maintenance
- Results of inspection and monitoring of conditions
- Cost/ benefit analysis
- Estimated service life
- Obsolescence (e.g. device becomes obsolete/out-of-date)
- Other (please specify):

52. Does your agency collect data on the overall health and maintenance of ITS devices and equipment?

Yes

What sources of data are used?

- Inspections
- Complaint calls
- Real-time monitoring
- Other (please specify):

For which of the following purposes does your agency use the data on equipment health and maintenance? (Check all that apply)

- To make investment decisions
- To monitor specified performance metrics
- To monitor specified performance trends
- To conduct benefit-cost analysis
- To communicate to decision makers
- To communicate to public
- Other (please specify):

No

DEDICATED SHORT RANGE COMMUNICATIONS (DSRC) STANDARD

53. Is your agency familiar with Dedicated Short-Range Communications (DSRC) technology?

Yes

No (go to Next Section)

54. Does your agency currently use or have plans to use dedicated short-range communications (DSRC) in operating any of its ITS infrastructure?

- Currently use DSRC
- Plan to use DSRC
- No plans to use DSRC (go to Next Section)

55. Is your agency using or does it plan to use any DSRC-enabled technologies to support the deployment of the following?

	Currently Using	Plan to Use	No Plans to Use
Safety applications (e.g. intersection collision avoidance)			
Mobility applications			
Tolling operations			
Commercial Vehicle Operations and regulation			

INTEGRATED CORRIDOR MANAGEMENT

56. Have you identified corridor(s) for the purpose of integrating operations across multiple transportation facilities (including freeways, major arterials, and public transit networks) in order to actively manage travel demand and capacity in the corridor as a whole?

- Yes
 - How many corridors have been identified for integrated transportation operations?
 - 1 corridor identified
 - 2 corridors identified
 - 3 or more corridors identified
- No (go to Next Section)

57. The next set of questions all pertain specifically to the corridor you identified above. If you identified more than one corridor, please tell us about the corridor where the greatest level of coordination is taking place. In your responses, please do NOT include coordination efforts that are occurring outside the specific corridor you have identified.

Please name the key facilities that comprise the corridor (please be as specific as possible):

- a. Freeway(s) (e.g., US-75):
- b. Key Arterial(s) (e.g., Greenville Avenue, US-75 Frontage Roads):
- c. Public Transit Services (e.g., DART Red/Orange Light Rail Line, MTS Express Bus):
- d. Other (e.g., freight, rail, bicycle, pedestrian):

58. Approximately how long is the corridor?

- Less than 10 miles
- 11-20 miles
- 21-30 miles
- 31-50 miles
- More than 50 miles

59. For each agency type listed below, please indicate whether you are currently coordinating or plan to coordinate integrated transportation operations in the corridor specified above. If yes, please provide the name of the agencies in the corridor with which your agency is coordinating (referred to as the "coordinating agencies" in this survey). Please do NOT include coordination efforts that are occurring outside the corridor. For each agency type, a-d, select only one response.

	Currently Coordinate	Plan to Coordinate	No Plans to Coordinate	Not Applicable	Agency Names
Freeway agencies:					
Arterial agencies:					
Transit agencies:					
Other agencies (e.g., MPOs, Toll Authorities, Port Operators):					

60. a. Has your agency signed any formal multi-jurisdictional or multi-agency Agreements, Memorandums of Understanding (MOUs), or other instruments with these coordinating agencies regarding the integrated operations of the corridor?

- Yes, already signed
 - One instrument signed
 - Multiple instruments signed
- Agreements, MOUs, or instruments are being developed (plan to sign)
- No, there is no plan to develop or sign Agreements, MOUs, or other instruments
- Do not know

IF SIGNED OR PLAN TO SIGN: Please describe what is covered by the Agreements, MOUs, or instruments:

61. How are data about conditions in the corridor shared among the coordinating agencies? (Check all that apply)

- Manual data sharing:** Corridor stakeholders call, radio, fax or email relevant corridor data to one another
- Automated sharing of real-time video data** (video servers/switcher communicate directly to one another in real time to share video images through video protocols)
- Automated sharing of real-time data** (computers, database servers communicate directly to one another to transmit data automatically (in real time) via center-to-center protocols)
 - In general, is this sharing of real-time data active or passive? (select one)
 - Active (your agency receives alerts; data is pushed to your agency)
 - Passive (your agency must access the data; no alerts are received)
- Information Clearing House/Information Exchange Network (IEN) between corridor networks/agencies** (a software system that collects, aggregates, warehouses and distributes traffic flow/transit performance data and incident/construction data for the corridor. All corridor agencies can access the agency/network information)
 - In general, is this sharing of data active or passive? (select one)
 - Active (your agency receives alerts; data is pushed to your agency)
 - Passive (your agency must access the data; no alerts are received)
- Other (please specify):**

62. We want to understand if data is sent and/or received among the coordination agencies in the corridor. For each type of data below, please indicate if your agency receives this data from the other coordinating agencies in the corridor, collects and sends this data to the other coordinating agencies, collects but does not send this data to the other coordinating agencies, or does not collect this data. For each item, a-i, check all that apply.

	My Agency Receives	My Agency Collects and Sends	My Agency Collects but Does Not Send	My Agency Does Not Collect	Not Applicable
a-Freeway incident data					
b-Freeway traffic volumes, speeds, or travel times					
c-Arterial incident data					
d-Arterial traffic volumes, speeds, or travel times					
e-Transit incident data					
f-Transit vehicle location data (AVL)					
g-Transit schedule adherence data					
h-Transit passenger count data					
i-Other data (please describe below):					

b. For each type of data that is sent or received among coordinating agencies (as indicated in part a above), please indicate with what level of frequency the data is shared. For each item, a-i, select only one response.

	0-5 Minutes	6-15 Minutes	16-59 Minutes	60+ Minutes
a-Freeway incident data				
b-Freeway traffic volumes, speeds, or travel times				
c-Arterial incident data				
d-Arterial traffic volumes, speeds, or travel times				
e-Transit incident data				
f-Transit vehicle location data (AVL)				
g-Transit schedule adherence data				
h-Transit passenger count data				
i-Other data (described above):				

63. For each of the following types of operations strategies please indicate whether your agency is currently coordinating or plans to coordinate operations with other corridor agencies across transportation facilities (i.e., freeway, arterial and transit) in order to achieve shared operations objectives. For each item, a-n, select only one response.

For example, if traffic signal timing is coordinated across facilities, then signal timing on arterials is adjusted based on information about both freeway and arterial conditions.

	Currently Coordinate Across Facilities	Plan to Coordinate Across Facilities	No Plans to Coordinate	Not Applicable
a. Traffic incident management				
b. Freeway ramp metering				
c. Emergency management (e.g., evacuations)				
d. Cross jurisdictional traffic signal coordination				
e. Traffic responsive signal timing/coordination				
f. Transit signal priority				
g. Physical bus priority (e.g. bus-on-shoulder)				
h. Demand-sensitive transit capacity increases (e.g., add cars/routes)				
i. Real-time parking availability information (e.g., at transit stations)				
j. Road weather management				
k. Planned special events				
l. Real-time traveler information delivered pre-trip				
m. Real-time information delivered en-route (e.g., Dynamic Message Signs)				
n. Electronic multimodal payment systems				
o. Other (please specify):				

64. How would you describe the institutional coordination among the corridor stakeholders? Please select one response from the following scale, which ranges from less formal institutional coordination (1) to more formal institutional coordination (5).

- 1 (Less Formal) - Ad hoc coordination; no regular meetings; corridor stakeholders address near-term issues only
- 2 - Informal working groups; regular meetings among corridor stakeholders
- 3 - Formally established working groups; assigned responsibilities for Integrated Corridor Management
- 4 - Funded staff person(s) and well-defined responsibilities for Integrated Corridor Management
- 5 - (More Formal) - Legal entity with dedicated resources and a governing board

65. Have the coordinating agencies in the corridor developed any of the following Integrated Corridor Management (ICM) documents for the corridor? For each item, a-d, select only one response.

	Document Completed	Currently Developing	Plan to Develop Next 2-3 Years	No Immediate Plans to Develop	Do Not Know
a-ICM Concept of Operations (ConOps)					
b-ICM System Requirements Specifications (SyRS)					
c-ICM Analysis Modeling and Simulation (AMS) Plan					
d-ICM Implementation Plan					

66. Have the coordinating agencies in the corridor developed a documented set of response plans or strategies, in any level of detail, that are based on shared operational objectives and that are designed to optimize performance in the corridor as a whole (e.g., across transportation facilities/modes) during conditions of both recurring and non-recurring congestion? In your response, please do not include response plans developed for emergency situations, such as evacuations.

- Response plans or strategies have been developed for day-to-day operations during conditions of both recurring and non-recurring congestion
- Response plans or strategies are currently being developed
- There are plans to develop response plans or strategies
- There are no plans to develop response plans or strategies (skip to last question for additional comments)
- Do not know

67. Has your agency deployed or does it plan to deploy a Decision Support System (DSS) to assist in the integrated operations of the Corridor?

NOTE: A DSS is a subsystem that utilizes measurements of real-time corridor conditions to recommend coordinated response plans to all corridor agencies. The DSS continues to update its recommendation based on corridor measurements showing changing corridor conditions.

- Yes, deployed
- Plan to deploy
- No (no plans to deploy)
- Do not know

68. Have the coordinating agencies identified corridor-level/multimodal performance measures (e.g., person throughput, average travel time, average travel speed, etc.) that will be used to measure the effectiveness of the strategies and response plans that are implemented in the corridor?

- Yes, corridor-level/multimodal performance measures identified
- Agency plans to identify corridor-level/multimodal performance measures
- No plans to identify corridor-level/multimodal performance measures
- Do not know

69. Please use the space below to provide any additional comments about the integration and coordination of operations in the corridor:

ITS FUNDING

70. Screening question: Do you have a separate budget for ITS?

70. a. Please indicate whether you track the budget separately for each of the following categories:

- ITS Planning and Systems Engineering
- Device Installation
- ITS Operations
- ITS Maintenance and Inspection
- Repair of ITS Technologies
- Do not track categories separately (go to next section)
- Other (please specify):

70. b. Please indicate the percentage of budget allocated to each category that is separately tracked:

- ITS Planning and Systems Engineering
- Device Installation
- ITS Operations
- ITS Maintenance and Inspection
- Repair of ITS Technologies
- Other (specified above)

ITS PURCHASE DECISION-MAKING

71. Please rate the importance of each of the following factors to your agency's decision to purchase ITS technologies: (1 = Not at All Important; 2 = Not Very Important; 3 = Neutral; 4 = Somewhat Important; 5 = Very Important) Please check only one rating box per row.

	Not at All Important	Not Very Important	Neutral	Somewhat Important	Very Important
Cost of initial deployment					
Cost to maintain and repair					
Public/constituent involvement					
Funding/grant availability					
Mobility benefits (e.g., to address congestion)					
Safety benefits					
Environmental benefits					
Integration with other agencies					
Integration with your current technologies					
Already used by other agencies					
Other (please specify):					

72. a. Does your agency have any plans to invest in new ITS technology or to expand current ITS coverage in 2014 through 2016?

Yes

Check all that apply:

Invest in new ITS

Expand current ITS coverage

No

72. b. Please describe new ITS (if applicable):

BENEFITS OF FREEWAY MANAGEMENT TECHNOLOGIES

73. Based on your agency experience, please rate the benefits of the following ITS technologies. Select a rating from 1 (No Benefit) to 5 (Significant Benefit) or No Experience in each row. Please check only one rating box per row.

	No Benefit (1)	(2)	Moderate Benefit (3)	(4)	Significant Benefit (5)	No Experience
Traffic Sensors						
Vehicle Probes						
Toll Tags						
Cameras						
Ramp Control						
Lane Management						
Traveler Information						
Automated Enforcement						
Archived Data						
Environmental Sensor Stations						

PLANNING FOR OPERATIONS

74. Is there a long range ITS plan to guide project/program selection?

Yes

No

75. Does your agency routinely utilize systems engineering to identify agency needs and requirements when implementing/procuring ITS?

Yes

No

76. Does your agency rely on sample or model procurement documents provided by FHWA?

Yes

No

77. Is your agency part of the Regional ITS Architecture used to support regional transportation planning?

Yes

No

78. Is your agency included in a Regional Concept for Transportation Operations?

- Yes
- No

79. Does your agency receive, in real-time, incident information (e.g., clearance activities, type severity, etc.) from any public safety agency?

- Incident Clearance
- Yes
 - No

- Incident Severity and Type
- Yes
 - No

80. Does your agency provide, in real-time, incident information (e.g., type, severity, etc.) and/or freeway information (e.g., travel times, speed and condition) to the following types of agencies? (Check all that apply)

	Incident Information (e.g., type, severity, etc.)	Freeway Information (e.g., travel times, speed and condition)
Freeway Management agencies	Yes / No	Yes / No
Arterial Management agencies	Yes / No	Yes / No
Public Transit agencies	Yes / No	Yes / No
Law Enforcement public safety agencies	Yes / No	Yes / No
Fire Rescue public safety agencies	Yes / No	Yes / No
Other agencies	Yes / No	Yes / No

81. Select all that apply concerning your agency's participation in regional coordination activities:

- No regular interagency meetings
- Regular meetings with other agencies to coordinate planning
- Regular meetings to coordinate operations
- Formal agreement on coordination and data sharing with other agencies
- Formal agreement to integrate operations with other agencies

ADDITIONAL COMMENTS

82. Please use the space below to provide any additional comments regarding your agency's deployment, operations or maintenance of ITS. (Please be as specific as possible when commenting on particular ITS technologies.)